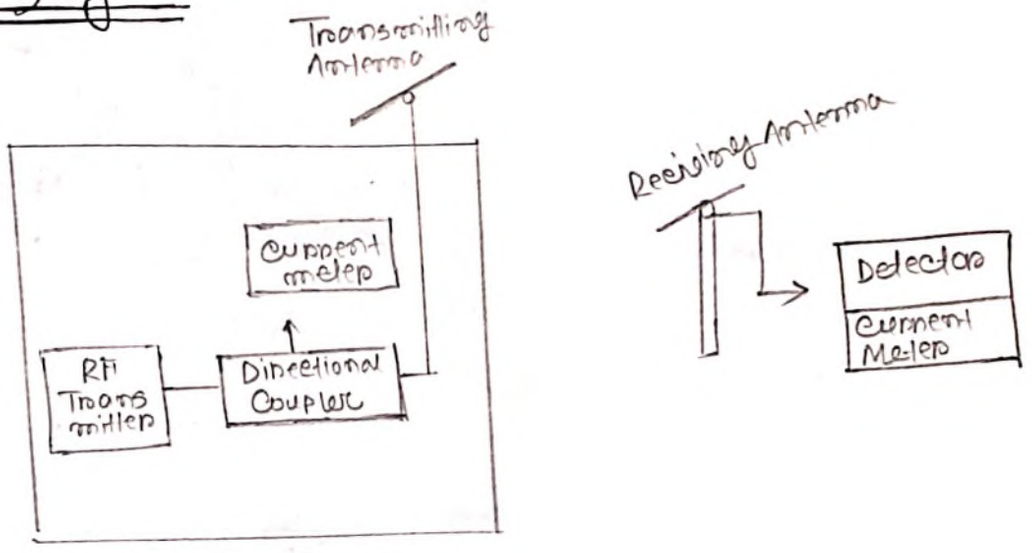
Experiment NO: 1

Title: Study of Radiation pattern of Simple Dipole Antena:

Objective:- To Study the radiation pattern of Simple Dipole Antena

□ Block Diagram:-



□ Theory: In Radio and Telecommunication a dipole Antena is the simplest and most widely used class of antena. It produces a radiation pattern approximately that of an electromentry electric dipole with a radiating structure supporting a line current so energized that the current has only one node at each other end. A dipole antena consists of two conductive element of equal length oriented end to end.

P.T.O

with the feed line connected between them. If the feed point of such an antenna is shorted it resonates at a particular frequency and is known as resonant antennas.

□ 1) Directivity:-

1) Directivity of an antenna is equal to the maximum power density.

$$1) = \frac{P(\theta, \phi)_{max}}{P(\theta, \phi)_{avg}}$$

if an antenna has a main lobe with both HPBW is equal; then its 1) Directivity $\frac{4\pi(Sr)}{\Omega_A(Sr)} = \frac{41,253 (deg)^2}{(HPBW)^2}$

Experimental 1) ata:-

Sl No	1) eg	Detector Reading in μA	Detector Reading in dBμA	Sl No	1) eg	1) etector Reading in μA	in dBμA
1	0	49	33.8	20	95	1	0
2	5	47	33.4	21	100	1	0
3	10	45	33	22	105	3	9.4
4	15	43	32.6	23	110	4	12
5	20	41	32.2	24	115	5	14
6	25	41	32.2	25	120	8	18
7	30	40	32.2	26	125	14	23
8	35	30	32	27	130	18	25
9	40	29	29.6	28	135	22	27
10	45	26	29.4	29	140	30	29.6
11	50	25	28.4	30	145	32	30
12	55	23	28	31	150	35	30.4
13	60	20	27.4	32	155	40	32
14	65	15	26	33	160	40	32
15	70	13	22.2	34	165	42	32.4
16	75	10	20	35	170	45	33
17	80	5	14	36	175	47	33.4
18	85	2	6	37	180	49	33
19	90	1	0	38	185	47	33
				39	190	45	32.6
				40	195	45	32
				41	200	49	
				42	205	40	

S.No	Freq	In S.F	in dBuA
43			
44	215	33	30·4
45	220	30	29·6
46	225	28	29
47	230	23	29·4
48	235	20	26
49	240	18	25
50	245	15	23·6
51	250	12	21·6
52	255	10	20
53	260	8	18
54	265	5	14
55	270	3	9·4
56	275	1	6
57	280	1	0
58	285	1	0
59	290	1	0
60	295	3	9·4
61	300	5	14
62	305	8	18
63	310	13	22·2
64	315	15	23·6
65	320	20	26
66	325	25	28
67	330	32	30
68	335	40	32
69	340	42	32·4
70	345	46	33
71	350	47	33·8
72	355	49	33·8
73	360	49	
74	365		
75	370		
76	375		
77			

1) Discussions:-

1) Connections and alignement of both Antennas should be made carefully

2) Reading must be taken carefully

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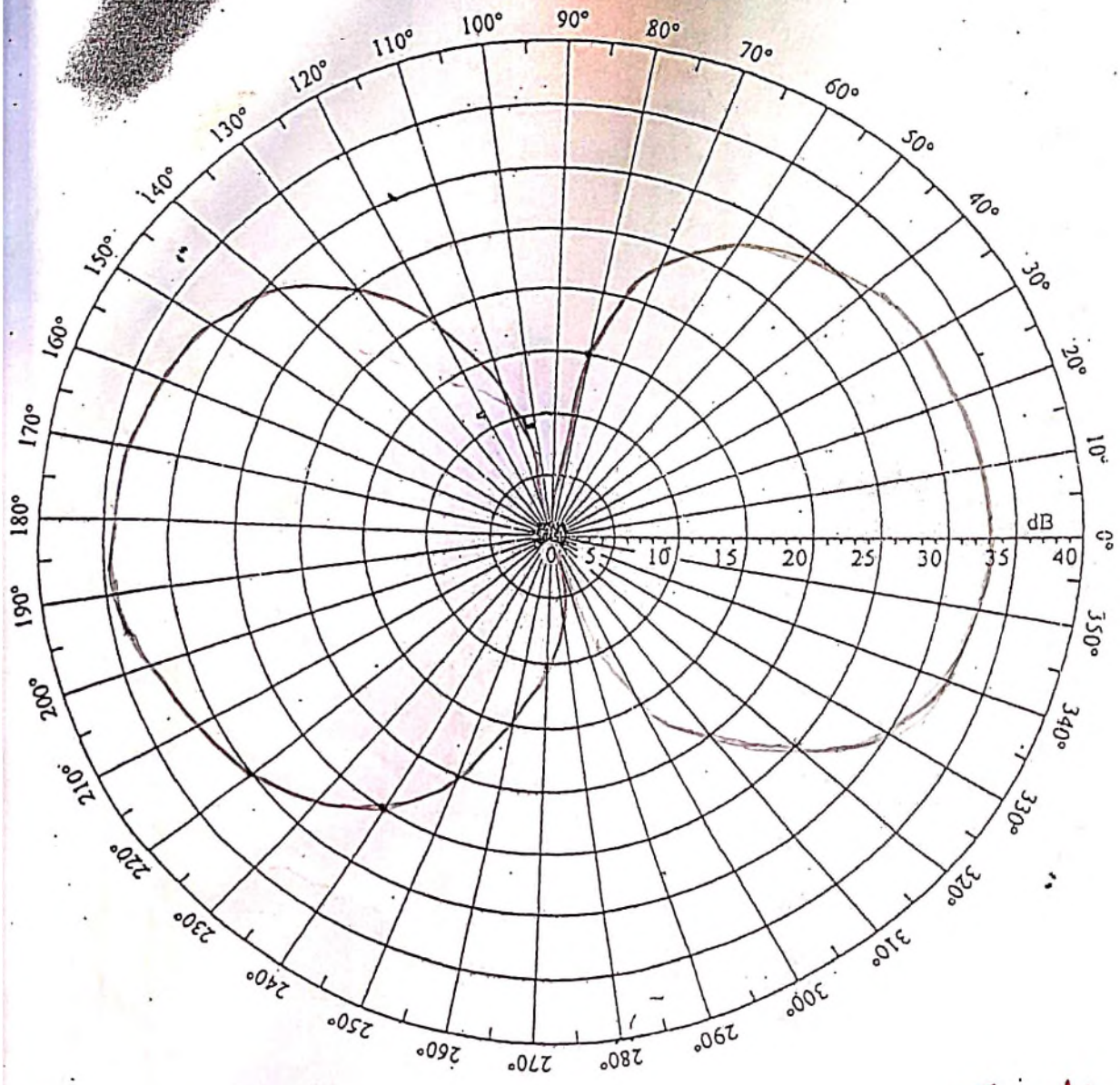
ENNA RADIATION CHARACTERISTICS

me (s).....

Date of Experiment .....

Antenna Type: Simple Dipole



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Worksheet

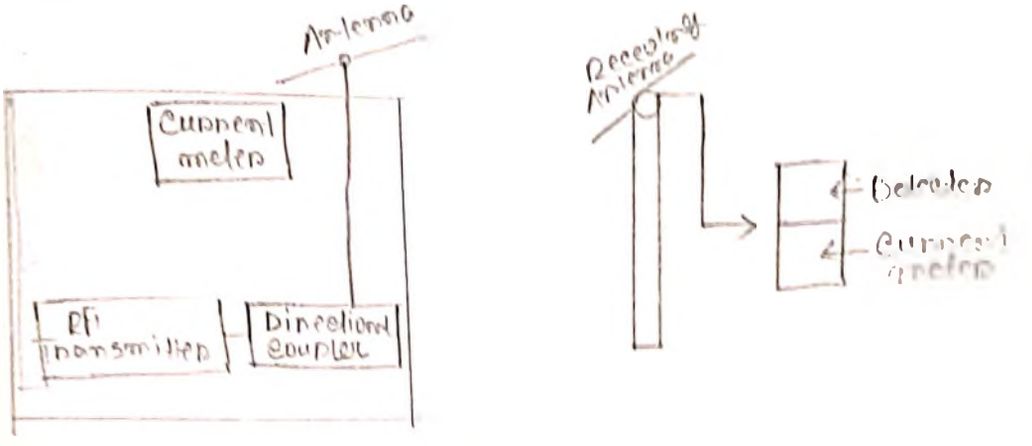
Deg	Detector Qd. in mA	Detector Qd. in dBuA	Deg	Detector Qed. in mA	Detector Qed. in dBuA
0	49	33.8	195	30	29.6
5	47	33.4	200	28	29
10	45	33	205	23	29.4
15	43	32.6	210	20	26
20	41	32.2	215	18	25
25	41	32.2	220	15	23.6
30	40	32.2	225	12	21.6
35	30	32	230	10	20
40	29	29.6	235	8	18
45	26	29.4	240	5	14
50	25	28.4	245	3	9.4
55	23	28	250	1	0
60	20	27.4	255	1	0
65	15	26	260	1	0
70	13	22.2	265	3	9.4
75	10	20	270	5	14
80	5	14	275	8	18
85	2	6	280	13	22.2
90	1	0	285	15	23.6
95	1	0	290	20	26
100	3	0	295	25	28
105	4	9.4	300	32	30
110	5	12	305	40	32
115	8	14	310	42	32.4
120	14	18	315	45	33
125	18	22	320	47	33
130	22	23	325	49	33.8
135	30	25	330		33.8
140	32	27	335		
145	35	29.6	340		
150	46	30	345		
155	42	30.4	350		
160	45	32	355		
165	47	32	360		
170	49	32.4	365		
175	47	33	370		
180	45	33.4	375		
185	43	33			
190	40	33			
	33	32.6			
		32			

Experiment NO: 2

□ Title:- Study of Radiation Pattern of Folded Dipole Antenna.

□ Objectives: To study the Radiation pattern of folded Dipole Antenna.

□ Block Diagram:



□ Transmitter Adjustment:

Turn the knob of the FS adjustment knob of the current meter fully anticlockwise to avoid the over range in the meter turn the power on and rise the level of the RF.

Adjust the level knob of the detector and the RF level knob of the transmitter to have 1/2 scales reading on the detectors meter.

Adjust the freq. screw in such a way so that this detector indicator maximum deflection. Never tight this adjustment fully clockwise

Also adjust the Antena match screw to obtain maximum recievers switch to REV position. Adjust the FIS ADJ. attenuator for a full scal reading on board meter

Switch to REV position. Read the new indication, then calculate the by the formula, $SWR = \frac{(FWD+REV)}{FWD-REV}$

Now, Slowly rotate the base of the antena mast and set the antena at different angles in 5 degree. Now down the antenna angle and take corresponding reading of the detector

□ 1) Directivity :-

1) Directivity of an Antenna is equal to ratio of the maximum power density

$$1) = \frac{P(\theta,\phi)_{max}}{P(\theta,\phi)_{avg}}$$

$$1) \text{ Directivity} = \frac{4\pi(Sr)}{\Omega(Sr)} = \square \frac{41.253(deg)^2}{(HPBW)^2}$$

1) Discussion :-

From this experiment we become to know that folded dipole antenna with two conduction connect on both side, and folded two from cylindrical shape to which feed is give at the conn

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observation Table:-

Antenna length = 17 cm

1) istance between Transmiter and Reciver - 49 cm

Deg	in mA	in dBuA
0	50	~~33.9~~ 34
5	45	~~33.8~~ 33.5
10	45	~~32.8~~ 33.5
15	43	32.2
20	40	33
25	39	
30	35	
35	30	
40	25	
45	25	
50	20	
55	15	
60	10	
65	5	
70	2	
75	1	
80	1	
85	1	
90	1	
95	1	
100	1	
105	1	
110	1	
115	1	
120	2	
125	4	
130	5	
135	8	
140	12	
145	15	
150	20	
155	25	
160	30	
170	40	
175	42	
180	45	
185	46	
190	47	
195	46	
200	40	
205	35	
210	33	
215	28	
220	22	
225	18	
230	12	
235	8	
240	4	
245	2	
250	1	
255	1	
260	1	
265	1	
270	1	
275	1	
280	1	
285	1	
290	1	
295	1	
300	1	
305	2	
310	5	
315	10	
320	13	
325	18	
330	21	
335	24	
340	32	
345	38	
350	42	
355	46	
360	50	
365		

Deg	in mA	in dBuA

observation Table:-

Antenna length = 17 cm

1) istance between Transmiter and Reciver - 49 cm

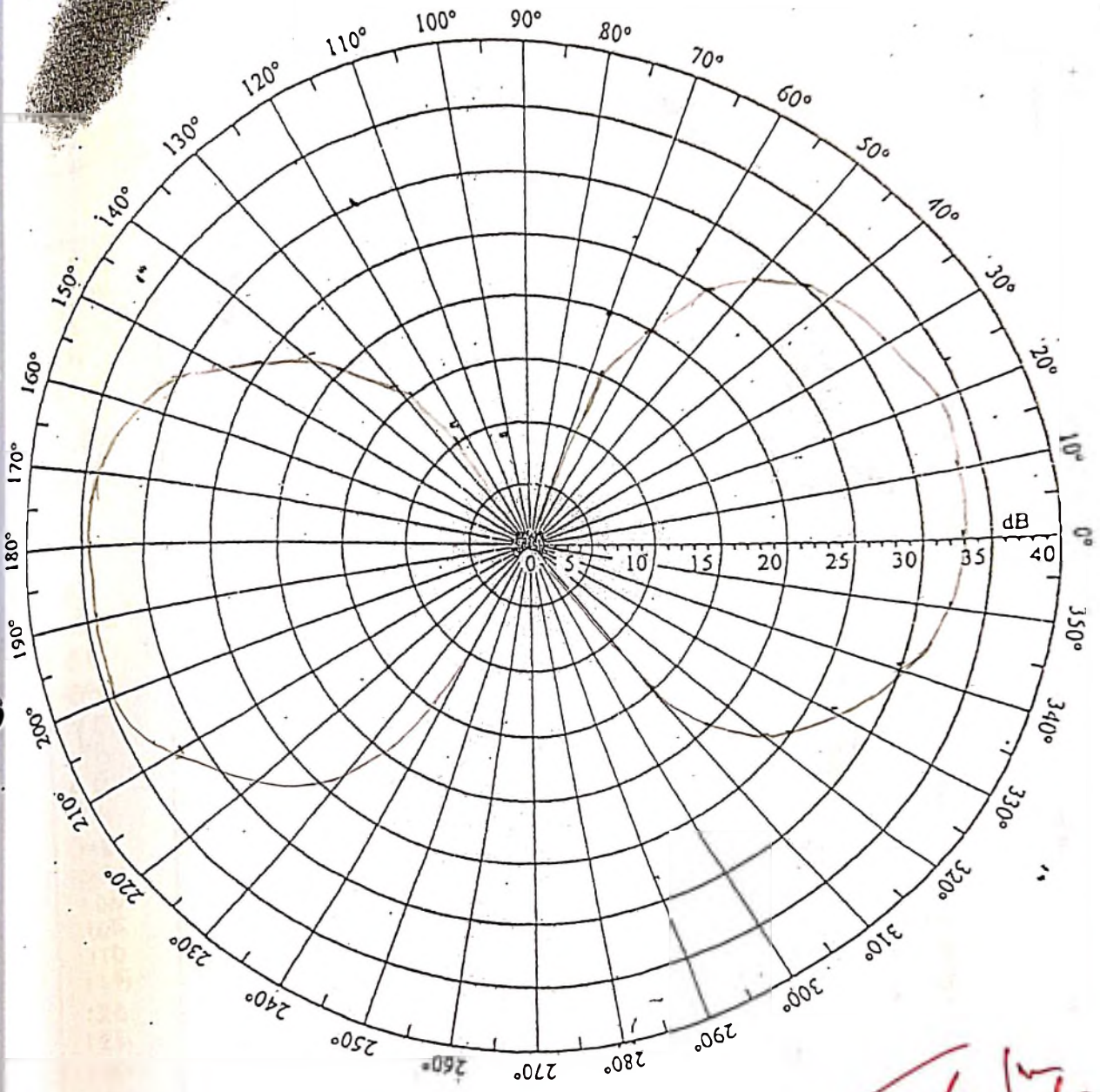
deg	in μA	in dBμA	deg	in μA	in dBμA
0	50	~~33.9~~ 34	170	40	
5	45	~~32.8~~ 33.5	175	42	
10	45	~~32.8~~ 33.5	180	45	
15	43	32.2	185	46	
20	40	33	190	47	
25	39		195	46	
30	35		200	40	
35	30		205	35	
40	25		210	33	
45	25		215	28	
50	20		220	22	
55	15		225	18	
60	10		230	12	
65	5		235	8	
70	2		240	4	
75	1		245	2	
80	1		250	1	
85	1		255	1	
90	1		260	1	
95	1		265	1	
100	1		270	1	
105	1		275	1	
110	1		280	1	
115	1		285	1	
120	2		290	1	
125	4		295	1	
130	5		300	1	
135	8		305	2	
140	12		310	5	
145	15		315	10	
150	20		320	13	
155	25		325	18	
160	30		330	21	
165	35		335	24	
			340	32	
			345	38	
			350	42	
			355	46	
			360	50	
			365		

ENNA RADIATION CHARACTERISTICS

Name (s).....

Date of Experiment.....

Antenna Type.....



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EXP-02

Title :- Study of Radiation pattern of Dipole Antenna

Experimental Data :-

Directivity =

SWR =

Antena length → 17 cm

Distance between Reciever and Source → 49 cm

SLNO	Deg.	Detector reading in μA	Detector reading in dBμA	Deg.	Detector Reading in μA	Detector Reading in dBμA
	0	50		195	46	
	5	45		200	40	
	10	43		205	35	
	15	40		210	33	
	20	39		215	28	
	25	35		220	22	
	30	30		225	18	
	35	25		230	12	
	40	20		235	8	
	45	15		240	4	
	50	10		245	2	
	55	5		250	1	
	60	2		255	1	
	65	1		260	1	
	70	1		265	1	
	75	1		270	1	
	80	1		275	1	
	85	1		280	1	
	90	1		285	1	
	95	1		290	1	
	100	1		295	1	
	105	1		300	2	
	110	1		305	5	
	115	1		310	10	
	120	2		315	13	
	125	4		320	18	
	130	5		325	21	
	135	8		330	24	
	140	12		335	32	
	145	15		340	38	
	150	20		345	42	
	155	25		350	46	
	160	30		355	50	
	165	35		360		
	170	40				
	175	42				
	180	45				
	185	46				
	190	47				

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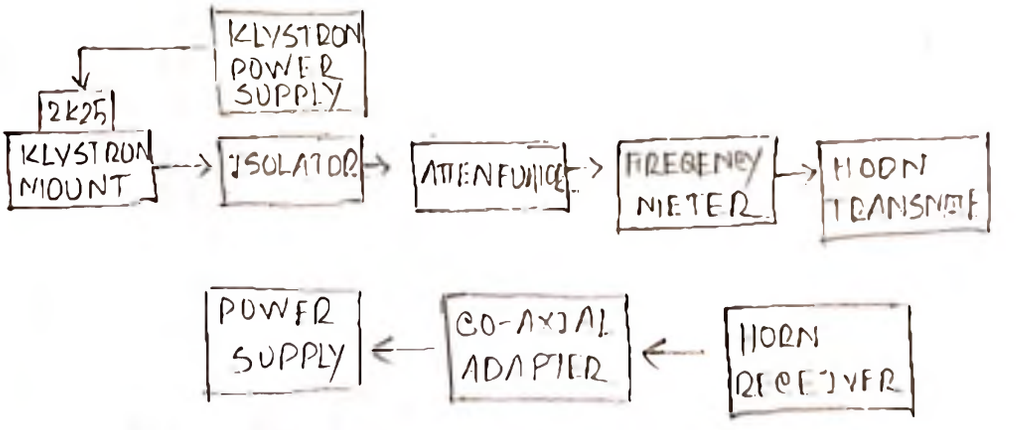
Experiment No: 5

Title:- Measurement of the Radiation pattern of Phyrmidal Horn Antenna.

objective: To measure the radiation pattern of pyrmidal Horn Antenna

Block Diagram:-



Theory:- If a transmission line propagating energy is left open at one end, there will be radiation from this end. In case a rectangular wave-guide presents a mismatch, Measurment of this radiation pattern of pyrmidal horn antenna. It radiates in many direction. The match will improve if the wave grid is a horn shape. The radiation pattern of an antenna is a diagram of field. Strength or more often the radiation antenna. An antenna pattern is of course 3-dimensional, but for Practical reasons it is normally presented as a two dimensional pattern

; on or several plans. The power intensity at the maximum
of the main lobe compared to an imaginary antenna with
same power fed to the antenna is defined as gain of
Antenna

observation Table

SL NO	Degree	Power meter Reading.
1	0	37
2	5	36.8
3	10	35.6
4	15	33
5	20	26
6	25	22.5
7	30	16.2
8	35	7
9	40	1
10	315	0
12	320	2
13	325	7
14	330	14.5
15	335	22
16	340	28.8
17	345	31
18	350	35.5

Discussion :- From this experiment we come to know that the horn antenna can be considered to be a wave guide that has been winded out in the form of a horn. As a result it finds many application in areas where wave guides are used.

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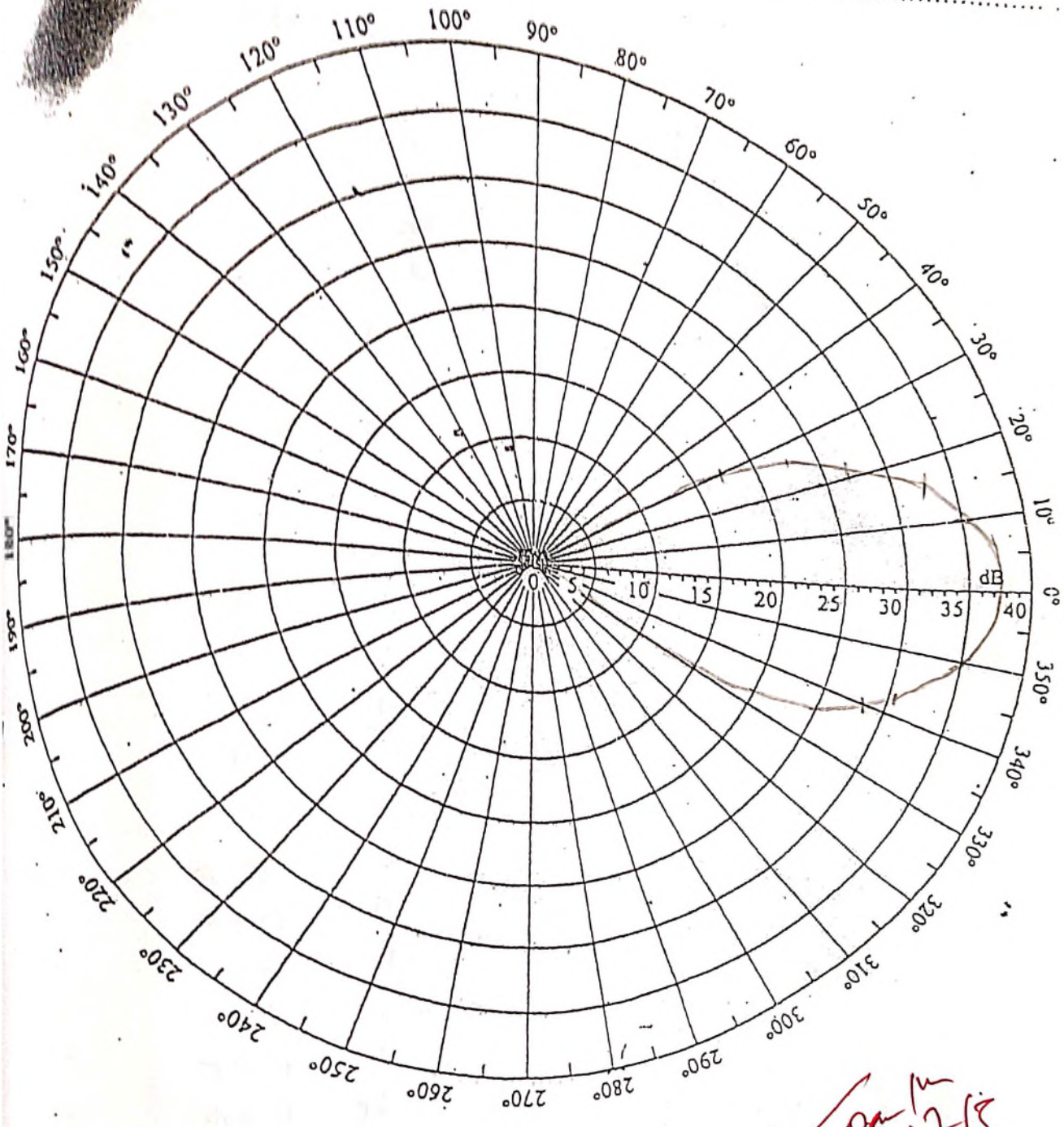
[redacted] ACTERISTICS

Name (s).....

Date of Experiment.....

Antenna Type....Horn Antenna.....



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Experiment No: 5

Title:- Measurement of the radiation pattern of Pyramidal Horn Antenna.

1). Frequency Range →

Experimental data :-

SI.NO	Deg	Power meter Reading
1.	0	37
2.	5	36.8
3.	10	35.6
4.	15	33
5.	20	26
6.	25	22.5
7.	30	16.2
8.	35	7
9.	40	1
10.	315	0
11.	320	2
12.	325	7
13.	330	14.5
14.	335	22
15.	340	28.8
16.	345	31
17.	350	35.5
18.	355	36.8
19.	360	37

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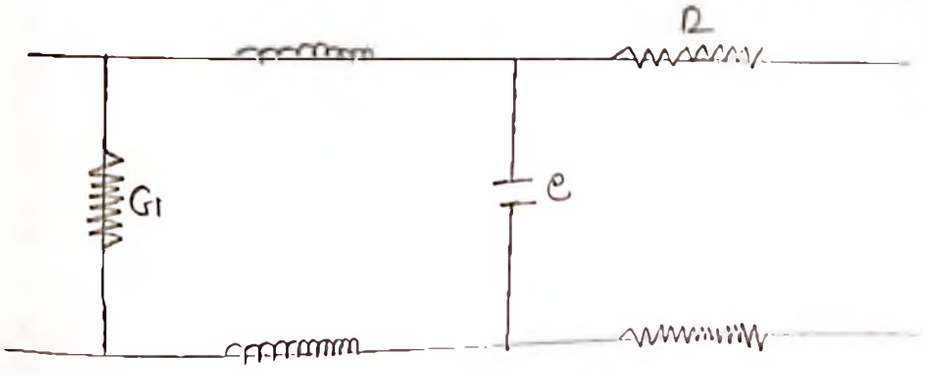
Title: Study of the characteristics impedence of transmission line.

objective: To measure the characteristics impedance of different transmission line.

Theory:- The ch. impedence of a uniform transmission line is the ratio of the amplitudes of voltage and current of a single wave propagation along line, that is a wave travelling in one direction in the absence of reflection in the other direction

Type of transmisson line including parrallel line. co-axial cables, and planner transmission line such as stripline and microstip.

Medium transmisson line. A transmission line having length of more than 80 kms but less than 250 kms is a medium transmission line. The parameters are distributed uniformly along the line. The medium T-m line is Nominal T model & Nominal π (Pi) modll.

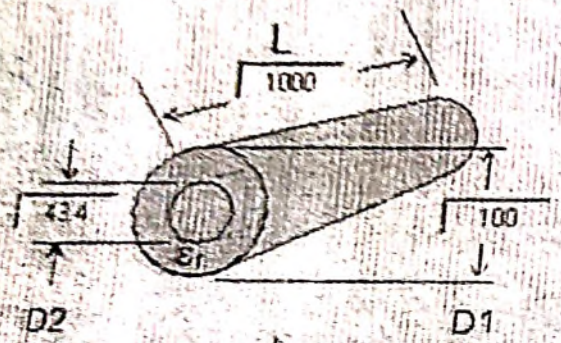


Equivalent circuit.

AppCAD - [Round Coax]

Calculate Select Parameters Options Help

Round Coax



Calculate Z0 (F4)

Calculate D2 (F3)

Z0 = 50.0 Ω

Elect Length = 0.085 λ

Elect Length = 30.5 degrees

Elect Length = 1000.000 mil (Air Line equiv.)

Delay = 84.725 ps

1.0 Wavelength = 11802.853 mil

Vp = 1.000 fraction of c

D1/D2 = 2.304

Dielectric ε_r = 1

Free Space

Frequency 1 GHz

Length Units mils

Dimensions of different lines

Dielectric $\varepsilon_r = 7.99$

Glass iron Sealing

frequency 1 GHz

length unit : mils

	D_1	D_2	L	Z0
1) dielectric $\varepsilon_r = 4.7$ Epoxy	100	10.214	1000	50Ω
1) dielectric $\varepsilon_r = 1$ Free Space	100	17.631	1000	50Ω
	100	46853	1000	50Ω

Parallel Wire line :-

frequency : 1 GHz

length unit : mils

	D	S	L	Z0
1) dielectric $\varepsilon_r = 7.99$ Glass iron Sealing	15	31.9	1000	50
1) dielectric $\varepsilon_r = 4.7$ Epoxy	15	26.03	1000	50Ω
1) dielectric $\varepsilon_r = 1$ Free Space	15	15.55	1000	50Ω